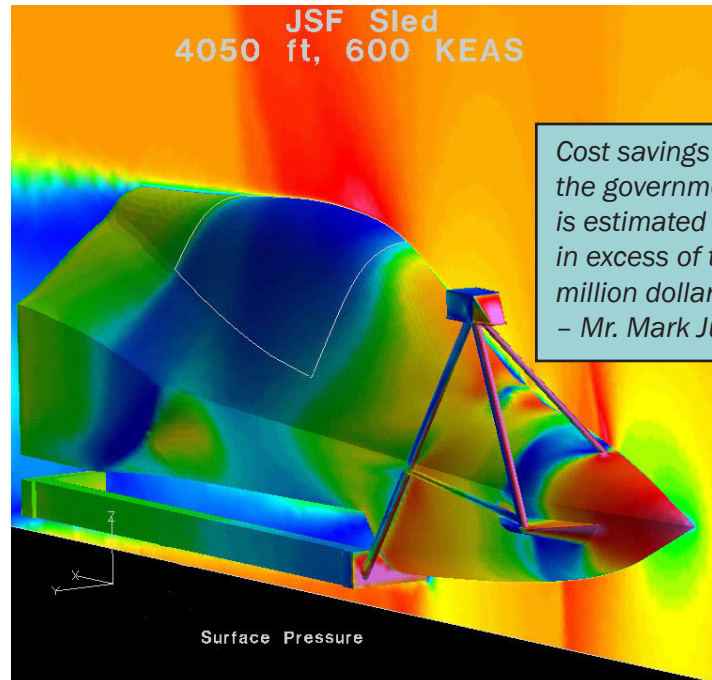# Improving Rocket Sled Testing Using High Fidelity CFD at the ASC MSRC

Project Purpose: *The Joint Strike Fighter (JSF) conventional aircraft escape system test rocket sled forebody was analyzed by ASC/ENFT to answer critical questions regarding aerodynamic effects on the escape system test data.*

The Computational Fluid Dynamics (CFD) study was the first of its kind to test the rocket sled forebody to allow a much higher degree of competence in the performance of the JSF Transparency Removal System (TRS). This study lowered the associated program risks while greatly reducing the uncertainty of the development and qualification process of the JSF program.

Mark Jurkovich, ASC/ENFT, at Wright-Patterson AFB, Ohio served as the Principal Investigator on this project. ASC/ENFT's analysis has greatly reduced the risk of the development and qualification process of the JSF program, and is the first time CFD analysis was used to optimize a sled forebody configuration. The work was done in a very timely manner that synergistically helped a contractor whose own CFD resources were lacking.

JSF Sled
4050 ft, 600 KEAS

Surface Pressure

Sled with camera mounting system moving at high speed

> *Cost savings to the government is estimated to be in excess of three million dollars.*
> *– Mr. Mark Jurkovich*

"Running these simulations at the ASC MSRC helped us determine a higher level of fidelity through the comparisons of these different flow models. These analyses resulted in several changes to the sled forebody configuration that yielded a much closer match to the free flight aircraft, and a fully successful TRS. We have advanced the science of future sled testing through the results of this proven CFD analysis."
> *– Mr. Mark Jurkovich, Principal Investigator, ASC/ENFT*

ASC MSRC System Utilization: SGI Altix, SGI Origin, and HP/Compaq SC-40.